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| 10/751,116      | 01/05/2004  | Hirohiko Ohtsubo     | Q73831              | 1362             |

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| EXAMINER |
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MARCHESCHI, MICHAEL A

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| ART UNIT | PAPER NUMBER |
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1755

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/751,116

Applicant(s)

OHTSUBO ET AL.

Examiner

Michael A. Marcheschi

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**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 16-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 22-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/9/04, 10/20/05</u> . | 6) <input type="checkbox"/> Other: _____  |

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Applicant's election without traverse of Group I, claims 1-15 and 22-25 in the reply filed on 9/9/05 is acknowledged.

Claims 2-15 , 22 and 24-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is indefinite because the examiner is unclear as to if the metallic layer is the metal defined in claim 1 or if is different.

Claim 12 is indefinite as to the limitation that defines the first and second coating layers coupled with the limitation "which has a composition different from that of the **first** layer" because if both the first and second coating layers can be nickel, how are they different. In other words, if the second layer is only limited a nickel layer, how can the first layer be a nickel layer, when taken with the latter limitation defined above (i.e. the layers must be of a different composition).

Claim 13 is indefinite as to the limitation that defines the second and third coating layers coupled with the limitation "which has a composition different from that of the **third** layer" because if both the second and third coating layer can be nickel, how are they different. In other words, if the third layer is only limited a nickel layer, how can the second layer be a nickel layer, when taken with the latter limitation defined above (i.e. the layers must be of a different composition).

Claim 14 is indefinite because the examiner is unclear as to whether this claim is (1) defining the coating amount of the metallic material relative to the abrasive or (2) defining the

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amount of surface that is coated with the metallic layer. This claim is not defined in a clear and concise manner, thus rendering the scope of the claim unclear. The claim is generally narrative and indefinite, failing to conform with current U.S. practice. It appears to be a literal translation into English from a foreign document. Finally, although a ratio can be determined from the wt% defined, the claim is defining a percentage and not a conventionally claimed ratio (i.e. A:B), thus the claim should be rewritten in terms of the percentage and not the ratio.

Claim 15 is indefinite because the examiner is unclear as to what the ratio is based on (what is the other component besides the coated grain). In other words, the claim, as written, does not clearly define a ratio, thus rendering the scope of the claim unclear. Is this claim stating that of **all** abrasive grains present, 5-100% are the coated grains? If so, the claim should be rewritten to clearly define this (as long as support is provided for any amendments). Finally, assuming that the claim be rewritten to clearly support a ratio, although a ratio can be determined from the wt% defined, the claim is defining a percentage and not a conventionally claimed ratio (i.e. A:B), thus the claim should be rewritten in terms of the percentage and not the ratio.

Claims 22 and 25 are indefinite because they depend on a non elected claim.

Claim 3-11 and 24 is indefinite because it depends on an indefinite claim.

The disclosure is objected to because of the following informalities:

The passage defined on page 10, line 22-page 11, line 2 is objected to in view of the limitation that defines the first and second coating layers coupled with the limitation “which has a composition different from that of the **first** layer” because if both the first and second coating layers can be nickel, how are they different. In other words, if the second layer is only limited a

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nickel layer, how can the first layer be a nickel layer, when taken with the latter limitation defined above (i.e. the layers must be of a different composition).

The passage defined on page 11, lines 3-14 is objected to in view of the limitation that defines the second and third coating layers coupled with the limitation “which has a composition different from that of the **third** layer” because if both the second and third coating layer can be nickel, how are they different. In other words, if the third layer is only limited a nickel layer, how can the second layer be a nickel layer, when taken with the latter limitation defined above (i.e. the layers must be of a different composition).

The passage defined on page 11, line 15-19 is objected to because the examiner is unclear as to whether this passage is (1) defining the coating amount of the metallic material relative to the abrasive or (2) defining the amount of surface that is coated with the metallic layer. Finally, although a ratio can be determined from the wt% defined, this passage is defining a percentage and not a conventional ratio (i.e. A:B), thus this passage should be rewritten in terms of the percentage and not the ratio.

The passage defined on page 11, line 20-22 is objected to because the examiner is unclear as to what the ratio is based on (what is the other component besides the coated grain). In other words, this passage, as written, does not clearly define a ratio. Is this passage stating that of **all** abrasive grains present, 5-100% are the coated grains? If so, it should be rewritten to clearly define this (as long as support is provided for any amendments). Finally, assuming that the passage be rewritten to clearly support a ratio, although a ratio can be determined from the wt% defined, this passage is defining a percentage and not a conventional ratio (i.e. A:B), thus this passage should be rewritten in terms of the percentage and not the ratio.

Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 10, 15 and 22 are rejected under 35 U.S.C. 102(b) as anticipated by Chen et al. (865).

Chen et al. teaches in column 3, lines 30-47, column 3, lines 60-63, the examples and the claims, a metal coated cubic boron nitride abrasive grain, wherein the abrasive grain, prior to coating, is roughened. The metallic coating can be a multilayer structure, the first coating being a carbide former (**such as**...) and the second coating can be nickel or a nickel alloy.

The claimed invention is anticipated by the reference because the reference teaches an article which comprises all of the claimed components and structure. Since the surface is roughened, it is clear that the metal coating penetrates the uneven part of the abrasive, thus broadly reading on the intruding limitation. In addition, during coating, it is the examiners

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position that defined localized diffusion reaction between the grain and the metal atoms will occur, thus the metal atoms will penetrate the surface. With respect to the groove aspect, since the surface is roughened, the formation of a grooved surface is apparent. With respect to claim 15, although not clear (see above), it is assumed that this claim is defining the content of the coated abrasive grains in relation to other abrasive grains and since the 100% of the abrasive is the coated abrasive, it anticipates this claim. With respect to claim 22, applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.

Claims 1-7, 10, 15, and 22-25 are rejected under 35 U.S.C. 103(a) as obvious over Chen et al. (865) in view of Lee et al. (064)

**The rejection of claims 1, 2, 10, 15 and 22 defined in this rejection is an alternative to the above rejection.**

Lee et al. In column 5, lines 1-10 states that during coating, defined localized diffusion reaction between the grain and the metal atoms occur, thus the metal atoms will penetrate the surface. The reference also defines that coated abrasive grains are known to be used to make resin bonded abrasive articles (column 6, lines 16-17).

With respect to claims 1, 2, 10, 15 and 22, the primary reference teaches a roughened surface and it is the examiners position that the skilled artisan would have appreciated that with a roughened surface the metal coating penetrates the uneven part of the abrasive, thus broadly encompassing the intruding limitation. In addition, during coating, it is the examiners position that defined localized diffusion reaction between the grain and the metal atoms will occur, thus

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the metal atoms will penetrate the surface, as is shown by the secondary reference. Although this reference does not use the same metal coatings, it is the examiners position that one skilled in the art would have appreciated that the same mechanism would occur absent evidence to the contrary. With respect to the groove aspect, since the surface is roughened, the formation of a grooved surface is apparent. With respect to claim 15, although not clear (see above), it is assumed that this claim is defining the content of the coated abrasive grains in relation to other abrasive grains and since the 100% of the abrasive is the coated abrasive, it reads on this claim. With respect to claim 22, applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.

With respect to claims 3-6, it is clear from the primary reference that the surface of the abrasive, prior to coating, is has grooves thereon (see above). Although the dimensions of the grooves might not be apparent from the teaching of "roughening" alone, it is known that the roughening improves the characteristics of the coating (see column 3, lines 16-29 of the primary reference). In view of this, it is the examiners position that the selection of the groove dimensions would have been appreciated by the skilled artisan through routine experimentation and optimization in order to optimize the strength of attachment between the boron nitride and coating.

With respect to claim 7, although the primary reference does not literally define the size of the boron nitride particles, the reference does define the size of the diamond particles (see examples) and since the concept of the reference is based on coating boron nitride or diamond



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particles, it is the examiners position that one skilled in the art would have appreciated that the size of the boron nitride particles can be consistent with the size of the diamond particles.

With respect to claims 23-25, the use of the coated abrasive grains according to the primary reference to make resin bonded abrasive articles would have been appreciated by the skilled artisan because this is a conventional use of coated abrasive grains, as shown by the secondary reference. The motivation is apparent in that the skilled artisan would have known the application of coated abrasive grains (i.e. products produces from).

Claim 14 is rejected under 35 U.S.C. 103(a) as obvious over Chen et al. (865) alone or Chen et al. (865) in view of Lee et al. (064) as applied to claim 2 above and further in view of EP 570 635.

The EP reference teaches in column 7, lines 16-24 that abrasive particles are known to be coated with up to 50% of a coating material based on the weight of the coated grain.

Although the primary reference fails to teach a coating amount, as is assumed to be defined by instant claim 14, it is the examiners position that one skilled in the art would have appreciated the amount required for the end use intended by routine optimization. The concept of routine optimization to determine the coating amount is clearly disclosed by the EP reference. In addition, the amount of coating is conventionally known to be up to 50%, as shown by the EP reference, thus it is the examiners position that one skilled in the art would have appreciated this amount in the teachings according to the primary reference because the lack any specific teaching would have implied to the skilled that conventional amounts can be employed.

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Claim 1, 2, 15 and 22-25 are rejected under 35 U.S.C. 102(b) as anticipated by Lee et al. (064).

Lee et al. teaches in column 1, line 35, column 3, lines 2-4, column 4, lines 14-16, column 5, lines 1-35, column 6, lines 15-16 and the claims, a metal coated cubic boron nitride abrasive grain, wherein the coating is a metal (see column 3, line 43) and the metal coating penetrates the surface of the boron nitride(i.e. by etching the surface of the boron nitride). In addition, it is stated that during coating, defined localized diffusion reaction between the grain and the metal atoms occur, thus the metal atoms will penetrate the surface. The reference also defines that coated abrasive grains are known to be used to make resin bonded abrasive articles (column 6, lines 16-17). Finally, the reference defines sizes and coating amounts.

The claimed invention is anticipated by the reference because the reference teaches an article which comprises all of the claimed components and structure. Since the surface is etched, it is clear that grooves will be formed. With respect to claim 15, although not clear (see above), it is assumed that this claim is defining the content of the coated abrasive grains in relation to other abrasive grains and since the 100% of the abrasive is the coated abrasive, it anticipates this claim. With respect to claims 22 and 25, applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.

Claims 2-7, 14, 15 and 22-25 are rejected under 35 U.S.C. 103(a) as obvious over Lee et al. (064)

**The rejection of claims 2, 15 and 22-25 defined in this rejection is an alternative to the above rejection.**

With respect to claims 2, 10, 15 and 22, the reference teaches an etched surface and it is the examiners position that the skilled artisan would have appreciated that with an etched surface, the formation of a grooved surface is apparent. With respect to claim 15, although not clear (see above), it is assumed that this claim is defining the content of the coated abrasive grains in relation to other abrasive grains and since the 100% of the abrasive is the coated abrasive, it reads on this claim. With respect to claim 22-25, applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.

With respect to claims 3-6, it is clear from the primary reference that the surface of the abrasive is etched, thus it has grooves thereon (see above). Although the dimensions of the grooves might not be apparent from the teaching of "etched" alone, it is the examiners position that the selection of the groove dimensions, as is dependent of the firing conditions, would have been appreciated by the skilled artisan through routine experimentation and optimization in order to optimize the strength of attachment between the boron nitride and coating.

With respect to claim 7, the reference defines a size which encompasses the claimed size.

With respect to claim 14, the reference defines a coating amount which encompasses the claimed amount.

Claims 1-15 and 22 are rejected under 35 U.S.C. 103(a) as obvious over EP 570 635 in view of by Chen et al. (865).

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The EP reference teaches in the abstract, column 3, lines 1-10, and column 4, line 13-column 6, line 15, a metal coated cubic boron nitride abrasive grain (having the claimed size), wherein the coating is one or more layers (reads on three layers) of an active coating material (metal or alloy), such as nickel, cobalt, etc, and **mixtures thereof**. The coating amount is defined.

Although the primary reference does not state that the uncoated boron nitride grain has a grooved (by roughening) surface, it is the examiners position that one skilled in the art would have appreciated and found it obvious to roughen the grain surface of the abrasive according to the EP reference prior to coating because this step is known to optimize the strength of attachment between the boron nitride and coating, as is clearly shown by the secondary reference. The motivation to roughen the surface is apparent in that roughening is known to improve beneficial properties of a metal coated abrasive. The use of any technique known to optimize the strength characteristics is clearly within the scope of the skilled artisan. With this being obvious, since the surface is roughened, it is clear that the metal coating penetrates the uneven part of the abrasive, thus broadly reading on the intruding limitation. In addition, during coating, it is the examiners position that defined localized diffusion reaction between the grain and the metal atoms will occur, thus the metal atoms will penetrate the surface. With respect to the groove aspect, since the surface is roughened, the formation of a grooved surface is apparent.

With respect to claims 3-6, it is clear from the secondary reference that the surface of the abrasive, prior to coating, is has grooves thereon (see above). Although the dimensions of the grooves might not be apparent from the teaching of “roughening” alone, it is known that the roughening improves the characteristics of the coating (see column 3, lines 16-29 of the

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secondary reference). In view of this, it is the examiners position that the selection of the groove dimensions would have been appreciated by the skilled artisan through routine experimentation and optimization in order to optimize the strength of attachment between the boron nitride and coating. In view of this, the limitations of claim 1-7 are met.

With respect to the coating layers of claims 8-11, the primary reference state that nickel can be the coating. With respect to claims 12-13, the reference teaches at least one coating layer and this reads on 2 or 3 active coating layers, the coating layers being selected from a metal or alloy, such as nickel, cobalt, etc, and **mixtures thereof**. Since each coating layer can comprises nickel alone or alloyed with another metal, this reads on claims 12-13 because as is clear each coating can be nickel alone or contain nickel, thus the coating layers can be of differing compositions as is required by the instant claims.

With respect to claim 14, the EP reference defines a coating amount which encompasses the claimed amount.

With respect to claim 15, although not clear (see above), it is assumed that this claim is defining the content of the coated abrasive grains in relation to other abrasive grains and since the 100% of the abrasive is the coated abrasive, it reads on this claim.

With respect to claim 22, applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.

**In all of the above rejections, the examiners acknowledges that instant claims 8-13 define how the metal is coated (i.e. electroplated, etc.), however, these are process limitations which do not impart patentability to product claims.**

In view of the teachings as set forth above, it is the examiners position that the references reasonably teach or suggest the limitations of the rejected claims.

**A reference is good not only for what it teaches but also for what one of ordinary skill might reasonably infer from the teachings. *In re Opprecht* 12 USPQ 2d 1235, 1236 (CAFC 1989); *In re Bode* USPQ 12; *In re Lamberti* 192 USPQ 278; *In re Bozek* 163 USPQ 545, 549 (CCPA 1969); *In re Van Mater* 144 USPQ 421; *In re Jacoby* 135 USPQ 317; *In re LeGrice* 133 USPQ 365; *In re Preda* 159 USPQ 342 (CCPA 1968). In addition, "A reference can be used for all it realistically teaches and is not limited to the disclosure in its preferred embodiments" See *In re Van Marter*, 144 USPQ 421.**

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549; *In re Wertheim* 191 USPQ 90 (CCPA 1976).

Applicants use process limitations to define the product and "product-by-process" claims do not patentably distinguish the product even though made by a different process. *In re Thorpe* 227 USPQ 964.

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Evidence of unexpected results must be clear and convincing. *In re Lohr* 137 USPQ 548. Evidence of unexpected results must be commensurate in scope with the subject matter claimed. *In re Linder* 173 USPQ 356. To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside (i.e. as well as the upper and lower limits) the claimed range to show the criticality of the claimed range. *In re Hill* 284 F.2d 955, 128 USPQ 197 (CCPA 1960).

The references cited on the 1449 have been reviewed by the examiner and are considered to be art of interest since they are cumulative to or less than the art relied upon in the above rejections.

Any foreign language documents submitted by applicant has been considered to the extent of the short explanation of significance, English abstract or English equivalent, if appropriate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Marcheschi whose telephone number is (571) 272-1374. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/15/05  
MM

Michael A Marcheschi  
Primary Examiner  
Art Unit 1755